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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,696	12/01/2003	Toshiya Hataguchi	70021172-1	2553

7590 10/10/2006  
AGILENT TECHNOLOGIES, INC.  
Legal Department, DL 429  
Intellectual Property Administration  
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Loveland, CO 80537-0599

EXAMINER

WYATT, KEVIN S

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/725,696

Applicant(s)

HATAGUCHI ET AL.

Examiner

Kevin Wyatt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>0906</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Rothamel (U.S. Patent No. 6,639,206 B1).

Regarding claim 1, Rothamel shows in Fig. An encoder comprising: a drum (7, i.e., rotational portion) comprising a circular cylindrical surface characterized by an axis (8, i.e., axis of rotation) and a radius of curvature, said drum having a surface with a normal perpendicular to said axis; a first track (9, i.e., strip) comprising a plurality of alternating reflective (2, i.e., reflectors) and no-reflective stripes (11, i.e., lands) arranged on said circular cylindrical surface (5, i.e., rotating cylindrical surface), said reflective stripes comprising a portion of a said circular cylindrical surface, each reflective stripe having a circular cylindrical outer surface having an axis coincident with said axis of said drum; a first light source (1, i.e., emitter) that illuminates said outer surface of said reflective stripe at an oblique angle relative to said normal; and a first photodetector (3, i.e., detector) positioned to receive light from said light source that is reflected from said reflective stripes of said first track when said drum moves relative to

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said photodetector, an image of said reflective stripes of said first track being formed on said first photodetector (col. 5, lines 7-10), said image having a magnification that depends on said radius of curvature.

Regarding claim 5, said cylindrical surface (5, i.e., rotating cylindrical surface) lies between said first track (9, i.e., strip) and said axis (8, i.e., axis of rotation).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Chen (U.S. Patent No. 6,817,528 B2).

Rothamel shows in Figs. 1 and 6-7, an encoder comprising: a drum (7, i.e., rotational portion) comprising a circular cylindrical surface (5, i.e., rotating cylindrical surface) characterized by an axis (8, i.e., axis of rotation), said drum having a surface with a normal perpendicular to said axis; a first track (9, i.e., strip) comprising a plurality of alternating reflective and non-reflective stripes arranged on said circular cylindrical surface, said reflective stripes comprising a portion of a said circular cylindrical surface; a first light source (1, i.e., emitter) that illuminates said stripes at an oblique angle relative to said normal; and a first photodetector (3, i.e., detector) positioned to receive light from said light source that is reflected from said reflective stripes of said first track

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when said drum moves relative to said photodetector, an image of said reflective stripes of said first track being formed on said first photodetector and having a magnification that depends on said radius of curvature, wherein said first source emits a collimated beam of light. Rothamel does not disclose that said first light source that emits a collimated beam of light. Chen shows in Figs. 1-2 that said first light source (combination of (VCSEL) unit 202 and convex lens (212)) emits a collimated beam of light (collimated beam (222))(col. 6, lines 36-38). It would have been obvious to one skilled in the art to provide the to provide in Rothamel collimated lenses to collimate light rays for each light source for the purpose of maintaining alignment of active lighting area with the area of photodetector during drum rotation.

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Suganuma (U.S. Patent No. 6,448,996 B2).

Regarding claims 3 and 4 Rothamel discloses the claimed invention as stated above. Rothamel does not disclose that said drum rotates about said axis when a shaft is rotated and said shaft is coincident with said axis. Suganuma shows in Fig. 1 a shaft (18, i.e., axial shaft) which rotates drum (14). In addition, shaft (18, i.e., axial shaft) is coincident with the axis of drum (14)(col. 8, lines 20-31). It would have been obvious to one skilled in the art to provide the axial shaft of Suganuma to device of Rothamel for the purpose of providing a rotating means for the drum of Rothamel to enable the encoding means.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Karim-Panahi (U.S. Patent No. 5,4338,882).

Regarding claim 7, Rothamel discloses the claimed invention as stated above. However, Rothamel does not disclose a second track comprising alternating reflective and non-reflective stripes arranged on said circular cylindrical surface, a second light source for illuminating stripes at an oblique angle relative to said normal; and a second photodetector positioned to receive reflected light from reflectors which form images of light source on photodetector during rotation of drum relative to said second photodetector. Karim-Panahi shows in Fig1. a rotating shaft comprising two circumferential bands (4 and 4') of reflective marks adhered to cylindrical surface (column lines 66-68 and column 4, lines 1-9). Karim-Panahi also shows in Fig1. two photodetectors (8 and 8') designed to receive reflected light from light source (5 and 5', disclosed in col. 4, lines 10-11 but not labeled in Fig.1). It would have been obvious to one skilled in the art to provide in Rothamel a second track of alternating reflective non-reflective stripes, a second light source and a second photodetector for the purpose of collecting more data on the periodic motion of rotating member.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Karim-Panahi (U.S. Patent No. 5,4338,882), and Cohen (U.S. Patent No. 4,124,839).

Regarding claim 8, the combination of Rothamel and Karim-Panahi disclose the claimed invention as stated above. This combination does not provide a drum comprising two tracks where the widths of the stripes of the first track are different from

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the widths of the stripes of the second track. However, Cohen shows in Fig. 4 a cylindrical drum comprising six encoding tracks (170-180) comprising stripes of varying widths. It would have been obvious to one skilled in the art to modify the combination of Rothamel and Karim-Panahi by placing additional encoding tracks on the cylindrical drum as taught by Cohen for the purpose of providing additional encoding data to the system (column 9, lines 23-27).

### ***Response to Arguments***

11. Applicant's arguments filed on 09/21/2006 have been fully considered but they are not persuasive.

In response to applicant's argument regarding claims 1 and 5, that there are not any teaching that the reflectors have a circular cylindrical surface with an axis coincident with the drum, the examiner disagrees. Fig. 1 suggests that the device of Rothamel works regardless of the shape of the reflectors since as shown in Fig. 1, the reflectors are completely contoured to the shape of the drum.

In response to applicant's argument that Rothamel does not teach that an image of the reflective stripes having a magnification that depends on the radius of curvature of the drum is formed on the photodetector, and that providing a collimated beam of light renders invention of Rothamel inoperative, the examiner disagrees. First, the magnification inherently depends on the radius of curvature of whatever is being imaged. Second, a collimated beam of light provided to Rothamel would not render the

device of Rothamel inoperable since the detector needs only to image the light reflected back from the stripes.

In response to applicant's argument that the examiner has not pointed to any suggestion in the art that the encoder head taught in Rothamel and the corresponding stripes could be moved to inside the drum to provide the benefit recited in claim 6, the examiner disagrees. Providing an arrangement where the components operate from within the drum would allow the device be manufactured at a smaller size.

In response to applicant's argument that the second track does not provide any form of encoding data in Karim-Panahi, the examiner disagrees. The purpose for the second track (according to the abstract) is to enable the device to measure the relative twist angle of the shaft while torque is applied. The relative twist information is evident in the device when there is a phase difference between the two tracks when the rotational velocity is measured.

In response to applicant's argument that due to the fact that Karim-Panahi teaches two tracks of the same width, the additional track of Karim-Panahi is not useful in Rothamel, the examiner disagrees. The additional track is useful for the reasons stated above as they relate to relative twist of the shaft.

In response to applicant's argument that using tracks of different widths leads to an inoperable device in Karim-Panahi, and that the examiner does not point to any teaching in the art supporting two tracks having stripes of different widths can not accurately be compared the examiner disagrees. Since the space distribution of the stripes on either track do not require any uniformity (according to col. 4, lines 2-5), the



requirement that the widths of the tracks or the difference in the widths of the tracks should be equal is not essential to the operation of the device. In addition, the device taught in Karim-Panahi does not detect phase shifts in two signals of different frequencies. The frequencies of the two output signals corresponding to the two tracks taught in Karim-Panahi are the same because the rotational velocity of the shaft can only have one frequency if unless it somehow becomes deformed during rotation when torque is applied. However there is a difference in the phases of the two signals when there is relative twist in the shaft during rotation.

In response to applicant's argument that the examiner has not pointed to any teaching to show how one would make the measurement  $\omega$ , since the respective sinewave cycles are identical, the examiner disagrees. According to col. 5, lines 29-32, this measurement is made using the  $N$  number representing the number of times the sinewaves in Figs. 2-3 cross the zero scale per division of time.

Therefore all of the rejections of claims 1-8 are fully anticipated by the prior art provided.

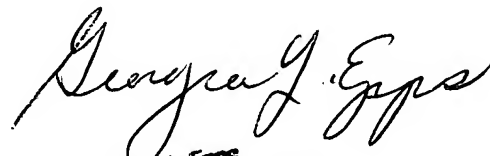
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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